UNITED
NATIONS

A

General Assembly

Distr.
GENERAL

A/CN.11/1991/4
28 February 1991

ORIGINAL: ENGLISH

INTERGOVERNMENTAL COMMITTEE ON SCIENCE
AND TECHNOLOGY FOR DEVELOPMENT
Eleventh session
22 April-3 May 1991
Item 5 of the provisional agenda*

ASSESSMENT OF THE IMPACT OF THE ACTIVITIES OF THE UNITED NATIONS SYSTEM IN PROMOTING ENDOGENOUS CAPACITY-BUILDING IN DEVELOPING COUNTRIES IN THE FIELD OF SCIENCE AND TECHNOLOGY

SUMMARY

The end-of-decade review of the implementation of the Vienna Programme of Action on Science and Technology for Development emphasized as major areas of focus in the future the programme of endogenous capacity-building of developing countries in science and technology and the need for closer co-ordination and harmonization of the activities of the United Nations system in science and technology, particularly at the country level. A great deal of work has been done in recent years on the concept of endogenous capacity-building, particularly by the Advisory Committee on Science and Technology for Development and the Centre for Science and Technology for Development. In so far as the impact of the activities of the United Nations system is concerned, the issue has to be treated both on a global and generic basis and at the level of individual countries. It is too early to draw conclusions. Since the Advisory Committee will be continuing its work, the present report should be treated as a progress report. A more definitive assessment will be made available to the Intergovernmental Committee at its twelfth session, in 1993, drawing upon work that will have been done in the mean time. The Committee might wish to consider the present report and provide further guidance to the Centre in its continuing work on this subject.

* A/CN.11/1991/1.

READEX FICHE

CONTENTS

	Paragraphs	Page
INTRODUCTION	1 - 2	3
I. CONTEXT	3 - 7	3
II. CONCEPT	8 - 24	4
A. Contribution of the United Nations system	18	7
B. Impact assessment at the country level	19 - 24	7
III. CONCLUSION	25 - 28	11

INTRODUCTION

1. The Intergovernmental Committee on Science and Technology for Development, in its resolution 2 (X), decided to include on the agenda of its eleventh session an item entitled "Assessment of the impact of the activities of the United Nations system in promoting endogenous capacity-building in developing countries in the field of science and technology" and requested the Centre for Science and Technology for Development to prepare, in consultation with member States, an analytical report on the contribution of the United Nations system to endogenous capacity-building, taking into account ongoing and planned pilot projects, inter-agency missions and other activities of the Centre.

2. The scope of the agenda item includes two dimensions that are pervasive in Committee resolutions 1 (X) and 2 (X): programmatic focus on endogenous capacity-building of developing countries in science and technology; and co-ordination and harmonization within the United Nations system in science and technology, especially at the country level. The principal modality concerning endogenous capacity-building in science and technology is the pilot studies which have been under way for the past three years and which the Committee has decided to continue and extend, in co-operation with the organizations and agencies of the United Nations system - in particular, the United Nations Fund for Science and Technology for Development - non-governmental organizations, intergovernmental organizations and bilaterals. An important component of the pilot studies is an assessment of the impact of the activities of the United Nations system as a whole in the concerned countries on building their endogenous capacities through inter-agency missions.

I. CONTEXT

3. The central message of the Vienna Programme of Action on Science and Technology for Development was that the international approach to mobilizing the immense potential of modern science-based technologies to development should be focused not only on facilitating access to modern technologies generated in the industrialized societies but also on building the endogenous capacities of developing countries. 1/ That message acquired added urgency in the 1980s. Developments in science and technology are on the cutting edge of global change, totally transforming the concepts of competitiveness, comparative advantages and strategic thinking. The gap between scientific discoveries and technological and commercial application has dramatically narrowed, leaving much less time to assess their impact and make necessary policy and programmatic adjustments.

4. Although great civilizations of past eras in the developing world were fertile in scientific thinking, the bulk of current new knowledge originates in the industrialized countries. As stated in the International Development Strategy for the Fourth United Nations Development Decade, "a solution to the debt problem, adequate resource flows, and a supportive environment in the areas of international trade and commodity markets are among the prerequisites for the reactivation of development during the 1990s. But, a sustained acceleration of the development process will not take place unless developing countries modernize and transform

their industrial and agricultural sectors and participate in the progress made possible by advances in science and technology." 2/

5. Transforming the industrial and agricultural sectors and reaping the benefits of advances in science and technology are extremely complex and painstaking processes, which, inter alia, require hospitable economic environments, domestic as well as international. As the Strategy succinctly states, "knowledge is today a crucial determinant of economic progress. The knowledge gap between the developed and developing countries has been widening and policies and measures are needed to help narrow it over the coming decade. High priority must therefore be given by the developing countries, raising their endogenous capacities and capabilities in this area." 3/

6. The picture that confronts many developing countries remains bleak. While many developed countries are moving towards knowledge- and information-based societies, many developing countries are struggling to survive as pre-industrial communities. Traditional technologies, which were once vibrant and productive, have been stagnating due, among other things, to the inadequate infusion of modern scientific knowledge. The idea of improving the productivity and competitiveness of traditional technologies by blending them with modern techniques and technologies has not acquired much momentum in many countries. The research capacities which many developing countries have established have, by and large, remained apart from the productive structures. The findings of research laboratories, primarily State-owned and State-controlled, have not permeated into the productive processes. In most developing countries, large numbers of scientists and technologists, particularly those with specialized skills, are increasingly seeking more rewarding openings in the industrialized countries, not only draining scarce human and financial resources but also crippling efforts towards self-reliance.

7. On the other hand, in many developing countries, there is an increasing number of scientists and technologists who are not adequately utilized in the development effort, suggesting a mismatch of available scientific expertise and opportunity. New technologies are eroding the advantages associated with natural-resource-based products and labour. The driving force of technological change in the industrialized countries has manifested itself, inter alia, in a process of "dematerialization" of production and in the substitution of synthetics for natural products, thereby depressing both the volume and prices of primary commodity exports. In short, what is sometimes called the "age of information technology" seems to be silently passing by most of the developing world. In an era of exploding options and arrays of information sources, the capacity to make informed and autonomous choices - endogenous capacity - becomes the key factor. This is the heart of the concept of endogenous capacity.

II. CONCEPT

8. The concept of endogenous capacity in science and technology, brought to the forefront of the global agenda by the Vienna Programme of Action, is at once very old and very new. It is old in the sense that all development, to be lasting and

meaningful, has to be endogenous and all activities, including the development co-operation activities of bilateral and multilateral institutions, are expected to contribute to the process. It is equally nascent in the sense that the concept has now quickened and become critical. It is topical in the context of the new approach to development co-operation that has been the subject of debate in the United Nations system as well as in the donor community, primarily in the Organisation for Economic Co-operation and Development (OECD). Inter alia, the approach includes a focus on participatory people-oriented sustainable development, building the absorptive capacities of developing countries and inducing synergism between domestic and external resources.

9. Another element is to make science and technology a dynamic, integral part of the development process and to make the most effective use of scientific and technological expertise and structures locally available, bearing in mind that, with ever-expanding technological choices, the opportunity for applying science and technology to a transformation of the life prospects of masses of poor people have never been greater. That transformation can only be achieved if science and technology is an integral part of a country's economic and social development strategy, in a way which ensures that it becomes a key factor in both private and public decision-making. In particular, as noted in a recent OECD report, "what increasingly defines the less-advanced developing countries is the weakness or even complete absence of a capacity to manage technological change", confronting them with "grave risks of falling further behind more advanced developing countries in their ability to compete in world markets while raising their income levels". 4/ The report goes on to state: "the key requirement is for poorer countries to develop the capacity to evaluate, select and apply the technologies relevant to their individual situations. This demands both a constant dialogue among key 'stakeholders' in the community to identify opportunities and requirements and a management capacity to translate these in the country's economic and fiscal strategies". As stated by the South Commission in its report, underlying the inadequacy of the efforts at technological development was the lack of appreciation of the contribution that science could make to development and, as a result, lack of purpose or commitment towards science, either basic or applied, including the commitment to self-reliance in technology. 5/ The messages coming from such diverse sources as the South Commission, OECD and the International Development Strategy are thus strikingly similar: developing countries have no alternative to building endogenous capacities in science and technology.

10. Obtaining access to foreign technologies on reasonable terms and assimilating them into the development process requires home-grown capacities to choose, apply and adapt. Access to, and purposeful utilization of, foreign technologies and the domestic generation of technologies and their penetration into the productive sector are, in reality, two sides of the same coin. The critical capacity is the ability to decide what to develop domestically, what and how to import from abroad, and how to integrate technological change into the growth process, including determination of the right points of technological entry. Many developing countries have, at considerable expense, established scientific and technological infrastructures such as research and development institutions; higher educational structures such as universities; consultancy, design and engineering organizations etc. Many have also formulated, with varying degrees of specificity

and success, science and/or technology policies. But as the South Commission has again aptly stated, science and technology policies had remained isolated from overall development.

11. The absence of an endogenous focus in science and technology is not confined to domestic efforts. It applies equally to bilateral and multilateral aid. Most external aid has remained subsumed in sectoral development, minimizing its contribution and making it very difficult to assess its direct impact on endogenous capacity-building in science and technology.

12. About the time of the mid-decade review of the implementation of the Vienna Programme in 1985, it became increasingly apparent that the successful implementation of the Programme could not be carried out in the absence of greater clarity on the concept of endogenous capacity-building and "operationalization" of the concept. The ACC Task Force on Science and Technology for Development, at the instance of the Centre for Science and Technology for Development, initiated a process and a programme. A pilot programme in selected developing countries has been launched. Major conceptual contributions have been made by the Advisory Committee on Science and Technology for Development, which considered the subject at its Goa, Vienna and Zhuhai meetings in 1988, 1989 and 1990. The Advisory Committee also established specific working groups and brought to bear on the subject a high level of intellectual capacity. It was as a result of all these efforts over the past five years that a broad intellectual and international consensus on the concept and the methodology crystallized.

13. The Advisory Committee has defined endogenous capacity "as the extent of domestic capability to exercise independent, informed judgement and actions regarding acquisition, deployment and generation of science and technology for economic social development". 6/ It further divided the capacity into four elements:

(a) Ability to make informed judgement on science and technology matters;

(b) Selection and utilization of technologies;

(c) Adaptation and accretion of technologies;

(d) Creation of new technologies.

14. Endogenous capacity is not, it needs to be noted, the same as indigenous research capacity, nor is it synonymous with infrastructure building. A critical mass of both is necessary but not a sufficient condition for endogenous capacity. It has as much to do with policy-making, priority setting, entrepreneurship, management and higher education as with sciences and/or technologies per se. It is closely related to human development but is more narrowly focused on policy options and decision-making capacity germane to harnessing science-based technologies to development priorities. UNDP's human development report of 1990 identified the rate of technical change associated with science, technology and the development of human capabilities as one of the critical factors for growth with equity.

15. The capacity is fundamentally based on the acquisition and retention of knowledge necessary for sound decision-making. Countries can acquire such a capacity but, if they do not sustain it by appropriate policies, can also lose it. History is replete with examples.

16. It is also important to put the concept of endogenous capacity-building in the context of sustainable development. Endogenous capacity-building in science and technology is a critical component of sustainable development since without the skills to make informed decisions, the needs of current and future generations cannot be balanced. The concept is also in harmony with the imperative of safeguarding the environment and protecting the ecosystems of planet Earth. Technological assessment includes environmental impact as one of the factors.

17. In more concrete terms, the pilot projects on endogenous capacity-building in science and technology encompass four interrelated elements:

(a) To bring coherence to the science and technology system (research and development institutions, universities, productive system, higher education, consultancy, design and engineering, etc.);

(b) To connect and bring technological innovation closer to macroeconomic management and development demand;

(c) To stimulate national consensus among the different stakeholders in the development process (policy makers, planners, financial institutions, academia, science and technology community, industry, organized public etc.) on a portfolio of prioritized initiatives in response to development demands;

(d) To assemble a coalition of resources drawn from domestic, bilateral and multilateral sources to help implement such a portfolio.

A. Contribution of the United Nations system

18. The United Nations system has long been engaged in science and technology and has channelled significant resources into developing countries, designed to assist them in their efforts to mobilize modern technology as a tool of development. Nonetheless, the approach of the system has remained diffuse in view of the plurality of the mandates and the pervasiveness of science and technology. Earlier attempts at impact assessment, such as the basic study on the efficiency of the United Nations system in science and technology (1981) 7/ and the COPA/COR (1987), 8/ were not successful due to difficulties of definition and boundaries. More detailed information concerning these aspects is contained in document A/CN.11/98.

B. Impact assessment at the country level

19. The market for the services of the United Nations system is countries, and at the level of individual countries an informed judgement can be exercised on how

effective the system has been and, more importantly, how it can do a better job in the future. There is a growing perception that the work of the United Nations system at the country level is too fragmented and is acquiring a dynamic and a rationale of its own, distinct from the mainstream of national plans and priorities. This issue has been addressed by the General Assembly during the past three years - in particular, at its forty-fourth session, in resolution 44/211. Considerable importance is being attached to country-level co-ordination and to the role of the United Nations resident co-ordinators in this regard. There is also a growing recognition of the cross-sectoral importance of science and technology in the context of the operational activities, as exemplified by the decision of the United Nations Development Programme (UNDP) to make science and technology one of the six priority areas of the future.

20. Most of the activities of the United Nations system at the country level, particularly those involving technical assistance, have technological underpinnings, and not all of them need be, or can be, focused directly on endogenous capacity-building in science and technology. They all have specific sectoral objectives and are undertaken in direct response to the request of concerned countries. It is also important to ensure that the underlying technologies are appropriate in the overall socio-economic context and do not impede efforts towards technological self-reliance. In addition, other activities, whose focus is scientific and technological development in the context of the Vienna Programme of Action, should contribute explicitly and directly to the process of building the endogenous capacities of developing countries in science and technology. Nevertheless, a clear distinction between sectoral activities with technological impact and scientific and technological activities focused on endogenous capacity-building is difficult to make.

21. This was the issue that the ACC Task Force on Science and Technology for Development addressed a few years ago. It initiated pilot projects on endogenous capacity-building in science and technology, as noted above. Inter-agency missions to selected developing countries to make impact assessments have been built into the projects in the belief that the contribution of the United Nations system is an integral component of the process. The methodology adopted was to engage the services of a local institution or consultant to make the assessment, based on clearly defined terms of reference and guidelines. The assessment process first surveys all scientific and technological activities financed through external resources - bilateral and multilateral, but dealing in greater detail with multilaterally aided activities - and then divides those activities into core or non-core - the former being directly related to the Vienna Programme of Action and the latter, to components of sectoral types of activities. It identifies a few core activities as case studies and makes an assessment of their impact, not only in terms of the objectives of the project but in relation to their contribution to endogenous capacity-building in science and technology.

22. The most difficult issue that had to be tackled was to identify a set of criteria with which the impact of the activities on endogenous capacity-building could be evaluated. While the formulation of specific criteria, acceptable to the system as a whole and to member States, is an exercise that is being undertaken separately, primarily by the Advisory Committee on Science and Technology for

Development, for the purpose of the inter-agency missions, the following broad considerations or factors were taken into account:

(a) The degree to which the external support has helped to develop human resources capable of making decisions in an autonomous way, measured through factors such as equipment, fellowships to train nationals, and training components etc.;

(b) The degree to which outside support fills a gap in the capacity of the institution in question;

(c) The nature and duration of external expert support in the execution of the project;

(d) The degree to which external support has sensitized national decision makers to take measures to strengthen endogenous science and technology capacity, measured through factors such as commitment of resources for science and technology - in particular, research and development;

(e) The degree to which external support complements support from other outside sources and national efforts to achieve autonomous growth in the science and technology output in a particular area;

(f) The degree to which the recipient country has been able to provide some of the technical assistance component from its own resources, measured through provision of experts and consultants in the execution of the project;

(g) The degree to which activities supported by external sources have continued to be supported through national resources, after the cessation of external support.

23. The reports of the consultants are the basis for the inter-agency missions, consisting of organizations and agencies such as the United Nations Educational, Cultural and Scientific Organization, the Food and Agriculture Organization of the United Nations, the International Labour Organisation, the World Health Organization, the United Nations Conference on Trade and Development and the regional commissions. The missions visit the countries and hold detailed consultations with senior officials of ministries such as planning, finance, science and technology, industry, agriculture and health, and with officials directly involved in the execution of the selected projects. The missions also engage in a frank dialogue with different stakeholders in the development process in the concerned countries and try to elicit a response to one basic and simple question - namely: If this activity had to be redone, what changes - if any - would be made so as to derive greater benefit in the context of endogenous capacity-building?

24. Another objective of the missions is to take stock of the system-wide range of science and technology activities in the concerned countries and examine the scope, if any, for further streamlining and harmonization. The following are the broad conclusions that arose out of the inter-agency missions:

(a) The perception that most United Nations activities at the country level overlap and that there is considerable scope for streamlining and integrating is exaggerated. With few important exceptions, most activities are specialized and respond to a specific need, as articulated in the project objectives, and cannot therefore be combined;

(b) Although modest in comparison to bilateral aid, the technical assistance of the United Nations system in science and technology for development has significantly contributed to overall scientific and technological development;

(c) The concept of endogenous capacity-building in science and technology is of relatively recent origin and has not yet been put fully into practice. Existing activities of the United Nations system were not designed directly to achieve that objective and, hence, are not susceptible to an assessment from this perspective;

(d) Some of the problems that need to be addressed in the future are the uneven quality of United Nations experts, delays in the supply of equipment and services, insufficient training of local personnel, inadequate modernization and maintenance of equipment after termination of the project;

(e) It is necessary that a high-level policy decision be taken that the concept of endogenous capacity-building be included among the guidelines for the formulation and assessment of operational activities of the United Nations system;

(f) Cross-sectoral science and technology activities should be executed, to the maximum extent possible, through national execution, which in itself is a contribution to endogenous capacity-building;

(g) The United Nations system should extend its relatively meagre but catalytic resources for science and technology for development over a longer period than the traditional five years, on a small number of programmes. At present the resources are too diffuse and are incapable of making a lasting contribution;

(h) Agreement should be reached before launching projects that, on their completion, they will be incorporated into national plans and supported through domestic resources;

(i) Greater visibility and specificity needs to be given to endogenous types of science and technology activities. One way of doing so could be to have a separate section in the UNDP country programme or other similar programmes of the United Nations system;

(j) Bilateral donors and multilateral donors should harmonize their efforts in science and technology at the country level so as to facilitate greater optimization of collective resources and programmatic complementarity.

III. CONCLUSION

25. The basic problem in coming to a somewhat definitive view on how far and how much the United Nations system as a whole is contributing to the process of building the endogenous capacities of developing countries is the absence of clearly defined, commonly accepted, operational criteria with which scientific and technological activities could be assessed. In their absence, it is not only not possible to make an ex post facto assessment but, perhaps more importantly, to integrate this dimension into the process of formulating future projects. If endogenous capacity-building in science and technology is to become a major factor in programming external assistance and take its place alongside other, more topical themes, this gap needs to be filled.

26. The Advisory Committee is continuing its work on this subject and expects to contribute in a more definitive manner to the central issue of how to differentiate between generic science and technology, activities which are mostly embodied in sectors such as industry, agriculture and health, and those that are directly designed and explicitly germane to the process of endogenous capacity-building.

27. Impact assessments and inter-agency missions have been conducted in only three countries. While offering valuable indicators, as mentioned above, they do not provide the "critical mass" necessary to make a representative assessment. As part of the pilot projects on endogenous capacity-building, missions assessments will be conducted in six more countries during the next two years. With a broader data base, a more accurate analysis can be attempted which might, with necessary nuances, be extrapolated to other countries.

28. In order to obtain contributions from the different organizations and agencies of the United Nations system, the work so far done by the Advisory Committee in this respect - particularly the guidelines it has formulated - have been communicated to the organs, organizations and bodies of the United Nations system with a request that they use the guidelines to make their own assessments of the extent to which their agencies are contributing to the objective of promoting endogenous capacity-building in developing countries. A summary of the reports received will be made available to the Committee as a conference room paper.

Notes

1/ See Report of the United Nations Conference on Science and Technology for Development, Vienna, 20-31 August 1979 (United Nations publication, Sales No. E.79.I.21 and Corr.1 and 2), chap. VII.

2/ General Assembly resolution 45/199, para. 55.

3/ Ibid., para. 56.

Notes (continued)

4/ Organisation for Economic Co-operation and Development, The Role of Science and Technology in Development Co-operation with Less Advanced Developing Countries in the 1990s (Paris, May 1990).

5/ See A/45/810.

6/ A/CN.11/91, para. 13.

7/ "Cross-organizational review of the medium-term plan of the organizations of the United Nations system and cross-organizational programme analysis in the area of science and technology for development" (E/1987/51).

8/ "Study of the efficiency of the United Nations system in the field of science and technology for development" (A/36/240).